

⁸~~20~~. The method of claim ⁵~~4~~ wherein the data transmitted to the central station includes satellite identification data and the step of calculating the location of said object to be tracked is additionally based upon the satellite identification data.

⁹~~21~~. The method of claim ⁵~~4~~ wherein the step of calculating the location of said object comprises calculating a point of intersection of curves defined by said propagation time differences.

¹⁰~~22~~. The method of claim ⁵~~4~~ wherein the signals from said GPS satellites are received at said object to be tracked, and including the step of transmitting time signals to said object to be tracked over a separate channel so as to maintain clock accuracy at said object to be tracked.

REMARKS

This case has been discussed in a personal interview courteously granted to co-inventor Harrison and the undersigned by Examiner Nguyen on August 12, 1997. As a result of that interview, this File Wrapper Continuation Application is being filed, and it is requested that favorable consideration be given to this application in view of these remarks.

The specification has been amended to correct a typographical error on page 15, to insert an inadvertently omitted term on page 18 (which is clear from the context of the sentence in which it has been added and the terms of equations (8), to spell out on page 18 in line 30 the equation described in the aforementioned sentence, and to provide antecedent basis in the specification on page 30 in line 35 for the "signal events" specified in original claims 15 and 16. Thus no new matter has been added to the case.

Claims 2-11, 14 and 16-22 are now in the case.

Claims 1, 12, 13 and 15 have been canceled.

Claim 3 has been rewritten in independent form to include the limitations of claim 1, and to define code word phase measurements based on equation (8) as per the discussion in the above mentioned interview, thereby patentably distinguishing over Brown et al. patent 5,225,842 considered separately under 35 USC §102(b) or in combination with Barnard patent 5,119,102 under 35 USC §103(a).

Claim 2 has been amended so as to depend from claim 3 and thereby patentably distinguishes over Brown et al. in combination with Barnard under 35 USC §103(a) in

the same manner as claim 3.

Claim 4 has been rewritten in independent form to include the limitations of claim 1, and to define bit phase measurements based on the modification of equation (8) set forth in lines 28-30 on page 18 of the specification, as per the discussion in the above-mentioned interview, thereby patentably distinguishing over Brown et al. and Barnard, and further in view of Janc et al. patent 4,785,463 under 35 USC §103(a).

Claim 5 has been amended to depend from claim 3 and therefore patentably distinguishes over Brown et al. in the same manner as claim 3. Effland et al. patent 5,008,679, like Brown et al., fails to teach or suggest use of code word phase measurements simultaneously derived from the signals transmitted from a plurality of GPS satellites and received at the object to be tracked. For these reasons, therefore claim 5 patentably distinguishes over any combination of Brown et al. and Effland under 35 USC §103(a).

Claim 6 has been rewritten in independent form to include the limitations of claim 1 and to define the receiver code-time offset for any satellite i as the time elapsed to a time t_r from the beginning of a code word in the signal from satellite i in which t_r falls, and to specify the code periods in the signal received from satellite i being in which time t_r falls. Such code-time offsets and code periods are neither taught nor suggested by Brown et al. or Barnard, and hence claim 6 patentably distinguishes over any combination of these two patents under 35 USC §103(a).

Claims 7 and 8 depend from claim 4 and therefore patentably distinguish over any combination of Brown et al., Barnard and Janc et al. under 35 USC §103(a) in the same manner as claim 4.

Claim 9 has been rewritten in independent form to include all of the limitations of the base claim and intervening claims. Since claim 9 was objected to, but held allowable if rewritten in independent form to include all of the limitation of the base claim and any intervening claims, this claim is now believed to be allowable. Similarly, claim 10 which depends from claim 9 and was objected to is now believed to be allowable as depending from an allowable base claim.

Claim 11 has been amended to depend from claim 3, and therefore is believed to be allowable over Brown et al. in view of Barnard under 35 USC §103(a) for the same reasons as claim 3.

Claim 14 has been rewritten in independent form to include the limitations of claims 12, 13 and 15. In particular, claim 14 recites first processor means for processing data from the receiver means at predetermined time intervals in synchronism with

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received signal events. Neither Brown et al. nor Barnard teaches or suggests learning (at the central station) the transmission time associated with the measurement instant (time of arrival) by making the measurement instant coincide with a predetermined GPS signal event whose transmission time is known by the central station. For these reasons, therefore, claim 15 patentably distinguishes over any combination of Brown et al. in view of Barnard under 35 USC §103(a).

Claim 16, which depends from claim 15, patentably distinguishes over Brown et al. and Barnard in the same manner as described for claim 15. Addition of Inamiya patent 5,160,935 to the combination of Brown et al. and Barnard still appears not to teach or suggest making the measurement instant coincide with a predetermined GPS signal event whose transmission time is known by the central station, as discussed with regard to claim 15. Moreover, while Inamiya teaches use of encoded data in the telemetry word to describe transmission times from the associated satellites, applicants teach use of the GPS telemetry-word preamble only as a marker or uniquely recognizable event in the signal and do not require decoding or using the telemetry time data at the sensor. Therefore, claim 16 patentably distinguishes over any combination of Brown et al., Barnard, and Inamiya, under 35 USC §103(a).

Claim 17, which depends from claim 16, patentably distinguishes over any combination of Brown et al., Barnard and Inamiya, as discussed in conjunction with claims 15 and 16. Moreover, none of these patents appears to teach or suggest decoding the GPS telemetry data time stamp in combination with measuring code or bit phases. Accordingly, claim 17 patentably distinguishes over any combination of Brown et al., Barnard and Inamiya under 35 USC §103(a).

Claim 18 has been rewritten in independent form to include the limitations of claim 12 and recites a first processor means for calculating a receiver bit phase for each of the satellites. The bit phase for any satellite i at a time t_r is defined as β_i / T_i^B where β_i is the receiver bit-time offset for satellite i and defined as time elapsed to time t_r from the beginning of a code word in the signal from satellite i in which t_r falls, and T_i^B defined as the bit period for satellite i at time t_r in the signal received from satellite i . Since none of Brown et al., Barnard or Janc et al. teach or suggest processor means for calculating a receiver bit phase, as taught by applicants, for each of the satellites, it is apparent that claim 18 patentably distinguishes thereover under 35 USC §103(a).

Claim 19 has been rewritten in independent form to include the limitations of claim 12 and recite a first processor means for calculating a bit-time offset for each of the satellites and for determining a bit period for each signal received from the

satellites, the bit-time offset being defined as time elapsed to a time t_r from the beginning of a code word in the signal from satellite i in which t_r falls, and the bit period for satellite i being determined at time t_r in the signal of satellite i . These features are neither taught nor suggested by any of Brown et al., Barnard and Janc et al. and therefore claim 19 patentably distinguishes thereover under 35 USC §103(a).

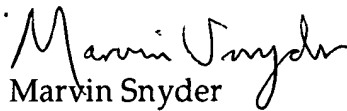
Claims 20-22 have been added. Claim 20, which depends from claim 4, is essentially similar to claim 2, and is believed patentable over any combination of Brown et al. in view of Barnard and Janc et al. under 35 USC §103(a) in a manner similar to that of claim 4.

Claim 21, which depends from claim 4, is essentially similar to claim 5, and is believed to be patentable over any combination of Brown et al. in view of Barnard and Janc et al. in the manner described for claim 4.

Claim 22, which depends from claim 4, is essentially similar to claim 11 while also specifying that the signals from the GPS satellites are received at the object to be tracked. This claim is believed to patentably distinguish over any combination of Brown et al., Barnard and Janc et al. under 35 USC §103(a) in the same manner as claim 4.

In accordance with the foregoing, it is believed that each of claims 2-11, 14 and 16-22 are patentable to applicants. Therefore a favorable action on the merits is earnestly solicited.

Respectfully submitted,


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